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## Paraphasia and Related Disorders in Primary Degenerative Dementia

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### INTRODUCTION

Impairment of confrontation naming is one of the most commonly observed language deficits in dementia (Critchley 1964; Stengel 1964; Lauter 1968; Irigaray 1973; Ajuriaguerra & Tissot 1975; Kirshner 1982; Hamanaka 1986). Although some remarkable features are reported which characterize word finding difficulties of dementia patients, e.g. (1) unnegligible role played by extra-linguistic deficits, especially by visual misrecognition (Lawson & Barker 1968, Rochford 1971), that was however not always confirmed in later studies (Kirshner, Webb & Kelly 1982; Bayles & Tomoeda 1983), (2) importance of lexical disruption deteriorating semantic distinctions of words (Schwartz, Marin & Saffran 1979; Martin & Fedio 1983; Obler 1983) etc, there exists so far no detailed analysis of responses to the initial sounds/syllables of target words given as auditory cues in cases of unsuccessful naming, apart from isolated observations indicating that word finding is as a rule not facilitated by such cuing manoeuvres (Obler 1981). Moreover, some conflicting data are reported in respect to the occurrence of phonological impairment, some authors pointing to the absence of phonemic paraphasias in contrasting with increasing verbal paraphasias, semantic neologisms and empty phrases in the progressive course of the disease (Obler 1981/1983), others, however, calling attention to the appearance of an aphasic syndrome that resembles Wernicke's aphasia caused by cerebral vascular lesion in the posterior part of the dominant hemisphere (Appell, Kertesz & Fishman 1982). The aim of this study is further to clarify the nature of naming impairment, especially paraphasic aberrations, in dementia, in comparison with that in aphasia of vascular origin that was studied in our two earlier investigations (Ohigashi, Hamanaka & Hadano 1984/85).

### SUBJECTS & METHODS

12 right-handed patients with primary degenerative dementia (PDD) of mild

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or moderate degree were given a 20-item confrontation naming task. Subjects characteristics (sex, age at onset, clinical diagnosis, and duration of the disease) are described in Table 1. For clinical differential diagnosis, the criteria of Hachinski et al. (1975) was adopted to exclude multi-infarct dementia. Each patient was asked to name a set of 20 black-and-white 6 × 6-cm. drawings of objects which derives from the Standard Language Test for Aphasia (SLTA: Hasegawa et al. 1977). In case of the patient being unable to produce a correct response within 15 sec. given at each item, the initial syllable of the corresponding target word was pronounced as an auditory cue by the examiner inviting him to further attempt to name the item (15 sec. more given). 6 out of 12 patients were tested more than two times (max. 6 times) during the progressive course of the disease followed up to max. 3.8 years after the first examination (Table 1). All verbal responses were tape-recorded, transcribed into written material, and classified according to the taxonomy which had been applied in our previous studies on paraphasia (Ohigashi, Hamanaka & Hadano 1984/85).

## RESULTS

### A. *Simple naming test* (i.e. without any cue given):

(1) In all cases of PDD, the speech output that was produced in the course of naming task was of "fluent" nature, exhibiting no feature of dysarthria, dysprosody, or short and agrammatic phrase formation.

(2) No literal paraphasia was observed in any PDD-patient in contrast with verbal paraphasia which was confirmed in some one or more examined stages of the disease of every patient except one (# 9) who was by the way tested only once (Table 1).

(3) The portion occupied by verbal paraphasia in the total quantity of speech output exhibited a clear tendency to diminish rather abruptly in PDD-cases with moderate or severe naming difficulty (less than 50% correct naming), apart from few exceptional cases (# 6-6, 7-2), in favour of increasing amount of empty phrases, circumlocutions, and those verbal expressions with which the patient comments upon his own verbal performances (Table 1); circumlocutions, however, tended to diminish or disappear in cases with the severest degree of naming impairment (# 1-4, 6-5, 6-6, 7-2, 12).

(4) The portion of verbal paraphasia in the total speech output in 3 cases of PDD (# 1-1, 1-3, 4, 7-2) came up near to or even surpassed that in two fluent vascular aphasics (Table 1—#A: atypical Wernicke's aphasia & #B: transcortical sensory aphasia) who produced the maximum amount of verbal paraphasia (and at the same time the minimum of literal paraphasia) in the group of 38 fluent aphasics with cerebral infarction (Ohigashi, Hamanaka & Hadano 1984). The naming behaviour of the latter two fluent-aphasics differed, however, from that of

Table 1.

Case No.-Test No.	Aetiology	Age at onset (years)	Duration (years)	Simple Naming								Total speech***
				Cor-rect*	Target word**	VP	LP	CL	Co	Ep	Others	
# 1-2			1, 6	1.00	80	8				12		25
# 2-(1)	Alz	45	2, 5	.95	68	11			14	4	4	28
# 1-1	Alz	52	1, 0	.90	73	20				8		25
# 3-1	Pi	46	0, 6	.65	22	7		7	9	55		58
# 3-2			0, 9	.60	19	15			20	46		65
# 1-3			2, 0	.60	38	46				12	5	31
# 4-(1)	Alz	58	2, 0	.60	23	17				61		55
# 5-(1)	SDAT	77	1, 6	.50	8	4		14	16	34	24	122
# 6-1	Alz	64	2, 5	.50	7	1		3		89		131
# 6-2			2, 8	.50	9			9		83		128
# 6-4			3, 7	.45	6	1		2	3	85	3	144
# 7-1	Alz	56	2, 6	.40	8	3		6	15	66	2	105
# 6-3			3, 2	.35	8	2			10	80		87
# 8-1	Pi	56	1, 5	.35	8			15	21	56		87
# 9-(1)	Pi	58	2, 0	.35	8				25	64	3	87
# 10-(1)	SDAT	66	3, 0	.35	4	1		10	3	79	3	169
# 11-2			1, 0	.35	9	5			8	76	2	75
# 11-1	Alz	62	0, 5	.30	8	2		6	13	64	7	74
# 8-2			2, 0	.30	5			25	8	60	3	106
# 8-3			2, 5	.25	3	1		13	20	59	4	146
# 8-4			3, 1	.20	5	4		4	6	80	1	69
# 8-5			3, 7	.20	3	1		10	19	64	2	121
# 8-6			4, 6	.20	4	6		5	17	66	2	83
# 1-4			2, 9	.15	9					91		32
# 7-2			3, 5	.10	6	18				71	5	34
# 6-5			5, 8	.05	1	4		1	10	81	3	71
# 6-6			6, 3	.00		7				89	4	67
# 12-(1)	Alz	55	11, 0	.00		8			9	81	2	72
# A	Inf	62	0, 6	.20	5	21	2	7		38	27	92
# B	Inf	70	0, 3	.30	7	21	2	1	4	60	6	93

\* Frequency per item (e.g. 1.00=20 correct responses/20 items) \*\* Portion occupied by each category of responses in total speech output (%) \*\*\* Numbers of "(Japanese) phrases"

# A: a patient of Wernicke's aphasia with predominantly verbal paraphasia (infarction)

# B: a patient of transcortical sensory aphasia with predominantly verbal paraphasia (infarction)

FL: 38 fluent-aphasics Alz: Alzheimer's disease SDAT: senile dementia of Alzheimer type Pi: Pick's disease Inf: infarction VP: verbal paraphasia LP: literal paraphasia CL: circumlocution Co: commenting speech EP: empty phrase

the 3 PDD-patients in respect of the portion occupied by each category of verbal responses, i.e. by target word vs. verbal paraphasia as well as literal paraphasia above all. The fluent-aphasics produced less target words (=correct responses) on the one hand and some amount of literal paraphasia on the other.

(5) Semantic verbal paraphasia exhibited a rather consistent tendency to occur in cases with mild word finding difficulty (# 1-1, 1-2, 1-3; 2; 3-1, 3-2; 4; 5),

Table 2.

Case No.-Test No.	Simple Naming*					Cued Naming*							
	Correct	VI	Paraphasias			Correct	VI	VS	VV	PP	Paraphasias etc		
			VS	VV	PP						PP	FNP	I Pa
# 1-2	1.00		.10			/							
# 2-(1)	.95		.15			.00							
# 1-1	.90		.25			.50							
# 3-1	.65	.15	.05			.00			.14		.14	.14	
# 3-2	.60	.25	.35	.05		.13			.34		.62	.26	
# 1-3	.60	.40	.05	.25		.29	.14				.14		
# 4-(1)	.60	.05	.15	.20		.00	.40						
# 5-(1)	.50	.10	.05			.10					.20		
# 6-1	.50					.30							
# 6-2	.50	.06				.30							
# 6-4	.45	.05		.05		.00							
# 7-1	.40	.05		.10		.80							
# 6-3	.35					.09						.16	.12
# 8-1	.35	.06				.23							
# 9-(1)	.35					.22							
#10-(1)	.35		.30	.05		.17					.08		
#11-2	.35	.06	.20			.10							
#11-1	.30	.06				.00							
# 8-2	.30					.28							.01 .01
# 8-3	.25	.10				.08						.08	
# 8-4	.20					.11					.34	.10	
# 8-5	.20	.04				.08					.38	.48	.06
# 8-6	.20	.14				.20					.44	.46	.04
# 1-4	.15					.11						.22	.30
# 7-2	.10	.80	.10			.00							
# 6-5	.05	.10	.05			.14							
# 6-6	.00	.30		.10		.00							
#12-(1)	.00	1.00				.00						.30	.70
# A	.20	.90	.05			.33					.07		
# B	.30	.55	.30			.50							

\* Frequency per item for each category of predomines (e.g. 1.00=20 responses/20 items)

# A: a patient of Wernicke's aphasia with predominantly verbal paraphasia (infarction)

# B: a patient of transcortical sensory aphasia with predominantly verbal paraphasia (infarction)

VI: semantically irrelevant verbal paraphasia VS: semantic verbal paraphasia VV: visual confusion simulating verbal paraphasia PP: phonemic paraphasia FNP: formal nominal paraphasia (Lecours et al. 1979) I: interruption of a target word Pa: palilalia

whereas semantically irrelevant paraphasia was produced in cases with almost all grades of severity of naming impairment (Table 2). The latter category of verbal paraphasia was observed in unnegligible amount also in the two fluent-aphasics above mentioned.

#### B. Cued naming test:

(6) It was found as one of the most striking as well as unexpected results that

some amount of phonemic paraphasias, mostly coming near to phonemic neologisms, and/or formal nominal (morphological verbal) paraphasia (Lecours et Lhermitte 1979) with the same initial syllable as that of a respective target word in both cases, was produced in 7 cases (# 1, 3, 5, 6, 8, 10, 12—Table 2), appearing however as a rule not before in later stages of those patients who were followed up for some years (# 1, 3, 6, 8). The occurrence as well as the amount of phonemic and/or formal nominal paraphasia(s) was not correlated with the severity of naming difficulty in general or the amount of verbal paraphasia produced in the simple naming test, and in most cases no manifest attempt to self-correction (*conduite d'approche*) was observed. It deserves special attention that 2 (# 1, 3) of these 7 cases produced in simple naming just the same amount of verbal paraphasia as the 2 vascular fluent-aphasics with predominantly verbal paraphasia above mentioned, whereas only a negligible amount of phonemic paraphasia (0.07 in #A) in cued naming was elicited in 1 of these 2 vascular fluent-aphasics. It would be pertinent to note that formal nominal paraphasia is considered to have more affinity with phonemic than with semantic paraphasia (Lecours & Lhermitte 1979; Hamanaka 1984).

#### COMMENTS

The examined cases of PDD exhibited a remarkable naming behaviour in so far as the distribution pattern of each category of their verbal responses in total speech output tended to differ from that seen in two representative cases of fluent aphasia of vascular origin [cf. the simple naming test (3)], and about one half of PDD-cases produced, in naming with the initial syllable of a target word given as an auditory cue, a definite amount of paraphasic errors of phonological nature (phonemic paraphasia and/or neologism, formal nominal paraphasia) which was only exceptionally observed in the two cases of fluent infarction-aphasia, notwithstanding that in both groups verbal paraphasia prevailed in simple naming. It may reflect one of essential and qualitative differences in the lexical as well as in the phonological aspects of word finding impairment between dementia patients with wide-spread cerebral atrophy and aphasics with focal brain damage. Especially the latter mentioned linguistic behaviour of PDD-patients, not yet described hitherto in the relevant literature, raises a novel problem that will require further elucidation in future. One of tentative interpretations would be that it might represent some beginning phonological impairment superimposed upon definite lexical disruption, remaining however latent in such a task as simple naming until it would manifest itself in more advanced stages of the disease.

#### SUMMARY

A confrontation naming task administered to 12 cases of primary degenerative dementia resulted in (1) semantic verbal paraphasia exhibiting a rather consistent

tendency to occur in cases with mild word finding difficulty, whereas semantically unrelated paraphasia was produced in cases with almost every grade of severity of naming impairment. (2) The portion occupied by verbal paraphasia as a whole in the total quantity of speech output tended rather to diminish in proportion of naming difficulty in favour of increasing amount of empty phrases, circumlocutions, and commenting speech. (3) About half of the cases exhibited a remarkable naming behaviour in word finding with aid of the initial syllable of a target word given as an auditory cue, producing a definite amount of phonemic paraphasia (often neologism) and formal nominal aphasia that were only exceptionally observed in 2 representative cases of fluent aphasia of vascular origin whereas in simple naming (without cue) predominantly verbal paraphasia was elicited in both groups. It suggests a hitherto unnoticed qualitative difference, probably in the phonological aspect, of word finding difficulty between dementia patients and aphasics with focal brain damage.

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